YORK HARBOUR.

TO

THE INHABITANTS OF THE TOWN OF YORK;

AND OF

THE PROVINCE OF UPPER CANADA.

GENTLEMEN:

If my tree has taken root, I shall never cease to acknowledge that I owe it to your cherished reception.

If opinions, founded upon observations due to the nature of my calling, can in any way be beneficial to your interests, I feel I am only performing a grateful duty in thus presenting them.

I am,
GENTLEMEN,
Your very Obedient, and
Very Humble Servant,
HUGH RICHARDSON.

YORK HARBOUR.

ANXIOUS to draw public attention to the state of York harbour, and impressed with the idea of the correctness of my views, I lay them in candour before the public, as interesting to the Commerce of Upper Canada, and, if correct, as vital to the prosperity of the town of York.

To those unacquainted with, or whose vocations deprive them of opportunities of observing the silent and subaqueous operations of nature in the port, I need scarcely apologize for laying before them the result of long observations. To the scientific, I submit my opinions with deference to their better judgement.

I may first, then, remind the country, that we had but three natural ports on the British side of Lake Ontario—those of Kingston, York, and Niagara, until the *once* Burlington Bay by the hand of art became a fourth.

Of the four, that of York, the seat of the capital, possessing more of the natural properties of a good harbour than any of the rest (having besides its splendid bason, an excellent outer roadsted) is the only one approaching to the verge of ruin.

Kingston harbour may be called an arm of the lake. Its outlet is too great for any serious inconvenience to be felt for years, from the deposit of the great Cataraquoi river.

The Niagara river (definitely speaking) is imperishable; and a private company has enterprisingly seized upon, and excavated the basin of the port, thereby giving the port a value before unknown; disarming the river of its winter terrors; and turning the current of the river to the profitable account of keeping an open port, at times when most others are closed.

Burlington harbour approaches nearest in aspect to that of York. It is of about the same dimensions—has the Dundas creek falling into it, as that of York has the Don: but then it has fifteen fathoms of water in a large area, whilst the bay of York has only 29 feet, confined to a very small one, thereby rendering inches of more value to the port of York, than feet to Burlington.

It may be necessary to the information of those unacquainted with the harbour of York, first to describe it;—I shall then transfer so much of a paper, that I had the honor to

read elsewhere, as accounts for its formation, and for the causes and progress of its decay, and as suggests means for its preservation.

York harbour is an eliptical bason of an area of eight or nine square miles, formed by a long sandy peninsula stretching from the point of land east of Asbridge's Bay, in a S. S. W. direction to a point abreast of the present Fort, from which it is about two miles distant, and upon it is a Light-House; thence it stretches towards the shore N. N. W. about three quarters of a mile, then dips under water, continuing in the same direction, carrying on it from two to three feet water, until within about 1,500 feet of the shore; it then breaks off, dropping suddenly down from the spot where the buoy is laid, to thirteen feet, soon deepening to fourteen and a half, the deepest bed of the channel, which is mud. Here ends the island sand. The channel then gradually shoals towards the shore; at 13 feet you strike rock, and 700 feet from the shore you have nine feet water, leaving a channel from that depth out to the buoy about 815 feet wide.

I shall now state, as briefly as possible, the theory of the formation of the port, and commence by assuming as a fact, that Lake Ontario came to its present level, not by any gradual descent, but as suddenly as the torrent sweep of the waters would allow, disengaged as they have been by the disruption of some barrier or rocky dam that held them suspended for ages at a much higher level. I say at a much higher level, because, there are various phenomena of the long and continued action of the wave in many parts of the adjacent shore, particularly the well known causeway of the ridge road, betwixt Lewiston and Rochester. It is not my purpose to explain these phenomena, but assuming them as proof of what I now assert, state that the lake has suddenly and violently been reduced to its present level, and that the effect produced by the action of the waters at that awful epoch, was nothing more than what we daily see as the miniature result of any common freshet.

If that a mill-dam break away that has so long upheld a pond as to have raised its bed by alluvial deposit above the level of the former bed of its creek, and this dam break suddenly away, what is the result?—No sooner do the rushing waters descend below the level of the artificially raised bed,

than they cut away such portion of the made soil as is immediately in their course, and leave the remainder in cloven and precipitate banks above.

Such then, I presume, has been upon a mighty scale the process upon Lake Ontario. The waters have retired violently, and in many parts below the level of their ancient bed; and where this has happened in soil capable of removal, such as the flats below Scarborough heights, the operation of the mill-pond is strictly exemplified. I adduce the Scarborough flats as immediately connected with my subject.

I will now suppose the great agitation of the waters subsided, and that the lake stood at its present level, without a shoal formed by the action of the wind and wave,—without a shoal formed by the present tributary streams, which are all coeval to that awful era.

At this period commenced upon its virgin shores, the works of dillapidation and deposit,—dillapidation, by the action of the wave, and its consequent deposit; and deposit, from the tributary streams.

There is indication enough to presume, that the high and bluff promontory of Scarborough extended at that era much farther out into the lake than it does at present; that since, torn periodically by the easterly gale, and its wreck swept along the shore by the stormy wave, struck past the indenture of the land about Asbridge's Bay and York, and sprinkled its first deposit in the direction of the wind, laying the foundation of the peninsula, as simply as a pail of sandy water thrown into a clear pool would depose the sand in the direction in which it was thrown. And thus has fallen from the charged wave of the storm, deposit on deposit, until, from the bosom of the lake, uprose the peninsula—the work of ages of repetitions, and the monstrous index of the ravages of countless easterly storms upon the highlands of Scarborough.

The same cause is still in operation, producing similar results—the progressive increase and march of the peninsula west, but with this variation, that the farther the formation is removed from the source of its supply, the more it is inclined to spread, the water only bearing along so great a distance the smaller and easiest suspended particles. Hence its great breadth at the west end, and narrow neck at the east. A continuation of the peninsula is the transverse shoal that stretches

across the entrance of the bay to within a few hundred feet of the shore, where it is suddenly broken off by the passage of the waters that keep the channel open.

This latter part of the formation is due to a phenomenon peculiar to the easterly storm upon the Lake,—the almost invariable and often sudden shifting of the wind to the opposite direction, combined with the outset of the waters of the bay, already raised by the easterly gale above their natural level, consequently falling with the shift of wind.

It must be generally understood, that the N. E. wind raises the water at the west end of the lake more or less according to its violence, and vice versâ with the S. W. wind.

Thus at the close of most of the easterly storms, whilst the lake is yet in commotion, and the seas ranging along the peninsula charged with alluvial matter; the wind shifts to the south and S. W. the charged waters are driven in upon the bay of York, whilst the waters of the bay are making outwards to regain the level of the lake, now lowering at the west, with the change of wind; and as the line of conflict betwixt the wave of the wind setting in, and the raised waters of the bay setting out, is at the verge of the bay, here is a consequent deposit. In other words, the waters of the lake charged with sand by the easterly storm, and driven back upon the bay by the shifting wind, are opposed at the entrance by the outsetting waters, and there forced to depose their burthen.

This shoal, or bar, would stretch right across the entrance of the bay, and reduce the channel to a few feet in width and inches in depth, sufficient to dribble forth the puny waters of the Don, but for the continued varying levels of the lake (affected more or less by every wind) and the reciprocating action of the waters of the bay producing in the channel a constant oscillation, or flux and reflux, by which a good and deep channel is kept open, and in which I find as much water now as in the time of the oldest surveys, say fourteen and a half feet.

Why the waters make themselves a passage along shore, and consequently keep there the channel of the port, to me is obvious. It is, that being met by the brisk westerly or easterly gale in their attempted passage over the shoal (ever to windward) to assume the level of the lake, setting out with the west wind, setting in with the east, they are dammed back by the ripple of the wave or broken water, and the great body makes

its way in under current along the shore, where it finds least obstruction from the opposing wind. Even the partial wind blowing in or out of the bay, carrying the surface water to leeward; sinking or overfilling the bay, that water is constantly returning in under current by the channel of the harbour to restore the equilibrium.—Blow along a narrow channel connecting two vessels filled with water, you will keep up a constant stream on the surface into one, and yet you will scarcely alter the level of either, as the water will return in under current, almost in the same ratio as it is driven by the surface from one vessel into the other.

The indication of this current, or oscillation of the waters in the channel, is the sudden breaking off, rounding, and steep declivity of the shoal or spit extending from the island to the buoy, where its progress is arrested by the passage of the waters, and where it falls from 4 to 13 feet, immediately soon deepening to 14½, and here totally ends the island sand; and mud, the alluvial deposit of the harbour, begins.

Thus far the formations of the port; but nature in parcelling out this beautiful sheet of water from the lake, enclosed within its bosom the seed of its decay.

The Don, like its relatives in consequence, the Humber, the Highland Creek, the Rouge, the Credit; whilst it dribbled its puny waters into the great lake, was, in importance, as the fly upon the horn of the bull:—but once embayed by the formation of the peninsula (like many a worthless fellow who owes his consequence to fortuitous circumstances) from total insignificance, it became the grand agent of destruction to one of the finest harbours on the lake.

The peninsula (from a vast shoal) has risen out of the lake at the western extremity, from a depth of 25 to 30 fathoms, and the bay has carried within it at least 15 fathoms at its deepest part.

But from the moment that the peninsula raised its protecting head above the waters, and screened the Don from the surges of the lake; the Don, like a monster of ingratitude, has displayed such destructive industry as to displace by its alluvial disgorgings by far the greater part of the body of water originally enclosed by the peninsula. The whole of the marsh to the east, once deep and clear water, is the work of the Don,

and in the bay of York, where now its destructive mouths are turned, vegetation shows itself in almost every direction, prognosticating the approaching conversion of this beautiful sheet of water into another marshy delta of the Don.

However the Don has been assisted in the work of filling up in some measure by the peninsula itself. For, whilst the easterly storm furnishes the material, the south and S. W. winds, when dry and stormy, send the sand into the bay in large drifts; thus the branchlike and encroaching ridges at the west end of the peninsula.

I trust now to convince the public, that the harbour of York owes nothing to the Don but its decay! It owes nothing to the Don for the navigableness of its channel. The waters of the Don can be of no more value to the channel of the port, than they are to the channel of itself. That is, were the channel of the harbour of York solely dependant on the waters of the Don, it would be just as navigable as is the channel of the Don, which is not navigable at all.

Imagine the bay of York completely dammed across the entrance, so as to exclude the waters of the lake at their highest level, with only a waste wier sufficient to carry off the superfluous waters of the Don. The sum in feet and inches of a section of this wier would be the sum total of the value of the Don to the navigation of the port. In the summer months it would scarcely float a boat.

The harbour owes the preservation of its channel entirely to the fluctuating levels of the waters of the lake, producing in it, a series of oscillations or of alternate currents, forbidding all deposit in the immediate theatre of their action. And as the strong east, and strong west wind have a direct opposite tendency upon the levels of each water; that is, the east wind to raise the lake, whilst it lowers the bay, and the west wind to lower the lake, whilst it superficially is filling the bay, it follows, that the greatest variations of levels are produced by these winds; and the process of restoring the equilibrium must be effected, and is effected, in under current in the channel, whilst the surface water apparently is carried in an opposite direction.

The strongest proof that the harbour owes nothing to the Don, or to the contributions of all the streams of the bay together for the navigableness of its channel, is, that in the months

of July and August, when the minor streams are to all significance dry, and the Don scarcely affords water enough to keep open even its own channel, that of the port is better, and deeper than at any other season of the year.

But, if an actual example of the theory I have laid down be necessary to support my argument, I adduce, as immediately to the point, the harbour of Burlington Bay. It contains about the same area as that of York; it has the Dundas Creek falling into it, of equal consequence with the Don. Before the present cut was made that converted the bay into a navigable port, the superfluous waters of the creek dribbled forth at a natural outlet in the beach, varying from six inches to two feet in depth, according to the supply, with a descent of channel sufficient to keep out the waters of the lake. No sooner was the present cut made and dredged down to eight and nine feet, admitting the free passage of the waters of the lake, than it deepened of itself to thirteen and fourteen feet, and the current flowed as often in, as out; proving thereby, that the channel was entirely due to the fluctuating levels of the two waters.

Now if my positions be correct, that we owe the open channel of our harbour entirely to the varying levels of the lake, and the decay of our harbour chiefly to the Don; what are the means that here suggest themselves of improvement and preservation?

The improvement must be to contract the channel; the the grand work of preservation to shut out the Don.

By contracting the channel, no water will be allowed to escape over the shoal, even in calms; and the motion of bodies of water in passing in and out of the channel will be accelerated, and their action felt at greater depth.

In speaking of calms, I have stood upon the lake shore in a perfect calm, and seen the water, by a certain mark, gradually rise and fall seven inches; each returning flux being at the period of a quarter of an hour. This undulation of the lake, I attributed to a partial and violent wind or squal at the east end of the lake, disturbing the equilibrium of the whole.

The process of contracting the channel will not be attended with any difficulty, nor with any expense commensurate to the value of the benefit to be derived therefrom. The first part of the plan is already provided for by the liberal provin-

cial legislative grant of £2,000 to construct a close pier from the shore, to be carried out 700 feet into nine feet water, this will come to within 820 of the buoy on the island spit, which forms the narrows of the channel, and will contract the channel to that width. Now from the buoy to the island, the spit or shoal carries upon it from 2½ to 3 feet water, and over which, to the prejudice of the channel, escapes a vast deal of water, which if confined to it, would be of infinite service.

To obviate this evil, I should propose to raise the crown of the spit above water; that is, to extend a dyke or dam on the top of it from the point of the island to the buoy; and as upon an average there is not above 3 feet water, and the dyke need not be raised above two, this cannot be attended with a heavy expense. Indeed a very small obstruction would soon create a bank outside to the westward, and have this advantage, that it would arrest the passage of the island sand over the shoal, which now extends its breadth inwards as well as outwards. With its military point of view, I have no concern; but I can only say, that whilst steamers can command 3 feet water out of the point blank range of a fort; in the event of war, they will prefer accommodating their construction to this convenience, in preference to the deeper channel and better mark.

By shutting out the Don you will exclude the grand source of alluvial deposit, which, in one easterly storm accompanied by rain, brings down and spreads over the bed of the harbour more soil than would employ an active dredging machine a month to remove. Even the cultivation of the country increases the destructive powers of the Don, for the plough of the husbandman annually loosening the soil, the rain storm furnishes the river with a much larger tribute of alluvial matter, than when it only washed in its descent the matted foot of the wilderness. Thus the Don, like a cautious and insiduous monster throws out before it two immense feelers of rushes as piloting its track of ruin; and layer by layer, as brick by brick the fabric rises to completion, steadily and fatally the bottom of the bay rises to the surface.

I am sure I average lightly, when I estimate the deposit in the bay from two to three inches annually, less about the shores but more in deep water, and in the immediate outset of

the Don. We must not be deceived into security by the little apparent change of depth about the shores. In such security the mischief will come upon us simultaneously. The grand deposit and filling up is yet in deeper water where the action of the wave is not felt, for it is easy to perceive that theland boundary of the bay, is the same now, as it was when the harbour was first formed, and yet one half of it has already become a vast delta of the Don; and of what remains of the western bay, there is only at its deepest part 29 feet, where originally there was at least fifteen fathoms.

By agitating the surface of very turbid water in a concave vessel, little or no deposit will take place at the borders, and powdered chalk may be added under the same operation until it is filled up, yet the whole surface will remain liquid to the last.

At the extremity of the upper wharf, which is 700 feet long, there is 8 feet 10 inches water—1,210 feet from the shore in the same direction, there is 15 feet 8 inches—1,822 feet out gives 17 feet 3 inches, and 2,552 feet out there is 20 feet 5 inches. At the lower, or what was called Mr. Cooper's wharf 680 feet long, the extremity of which, by his account, was laid down in 13 feet water, there is now 10 feet 4 inches.—1190 feet from the same, in the same direction, I find 16 feet 4 inches, and 1,802 feet out gives 17 feet 11 inches; so that upon an average, in the harbour, 700 feet from the shore there is 10 feet water, and 1,200 feet out 16 feet of water, after that, 100 feet in distance does not yield one foot in depth; and where upon an old survey I find six fathoms, or 36 feet laid down, I now only find 29 feet. I state all this to show, that the great deposit is in deep water, where it escapes observation. These distances and soundings were accurately taken on the ice this year, 1833. I should also remark, that the word peninsula and island is used indiscriminately for one and the same thing, the island being alternately one and the other.

When the peninsula first rose out of the lake, the Don fell into the bay, nearly about the middle, consequently the first operation of its alluvial deposit was to cut the bay in two, leaving the deepest water east and west. But as the prevailing winds were west, and the bay was open to the west, it followed that the outsettings of the Don were naturally driven east, and its disgorgings first choaked the passage in that di-

rection, and of course it flowed where least impeded, that is, west. But now the process has arrived at that period, by the constant washing of the west wind, sweeping the island sand and gravel against the marsh and outset of the Don, that it has formed all round the head of the bay a beach sufficiently elevated above the marsh to form a complete dyke, with the exception of the mouths of the Don. Dams may be thrown across these without difficulty, and the Don a little elevated, would soon work itself a passage through the marsh to the outlet at Asbridge's Bay.

But, if through negligence, or want of observation, the harbour is abandoned to itself; if, by some freak of nature the waters of the western bay find passage by the mouths of the Don, and easy egress to the Lake by the now extended outlet at Asbridge's Bay, then I say, adieu the western harbour; adieu the bay of York! No longer heavy outset, the sand beats in, the shoal at the entrance lowers but spreads, the channel fills, and the harbour of York becomes a large shallow sandy bay.

It has often been suggested to open a channel into the harbour from the east, through the neck of the peninsula and marsh, or, immediately into the bay of York, at what is called the portage. Without any local interest, but that of the benefit and preservation of the present port, I shall take the liberty of intruding my opinion also upon this subject, for any value it may possess.

As regards the cut at the portage directly into the bay of York, I never entertained the idea; for the shore on the lake side is so steep, falls so suddenly into deep water, is composed of loose shifting shingle stone, and the seas of the easterly storm so range along it, that any obstruction thrown out in the shape of pier would only create an arm of the beach around it.

As to the entrance at Asbridge's Bay, and through the marsh, which might be done, I apprehend, were it accomplished, it would in no way compensate for the difficulty and expense of the undertaking; and without great judgement and knowledge of effect, in managing the water communication betwixt the two bays, I fear the channel of York harbour would sustain serious injury by the event. The mischief to be apprehended, supposing the communication to be made, would be this:—

When a lengthened period of the easterly storm had risen the waters of the lake at the west end, and consequently filled the bay of York, and the wind shifted to the west, lowering the lake again, the waters of the bay would naturally make an effort by the nearest outlet to follow the level of the lake. But here, at the mouth of York harbour, met and damed back by the fresh west wind, the superfluous water, instead of forcing its way to windward in under current, as formerly obliged to do, it would be drawing off to leeward, and transvasing into the eastern bay, to the prejudice of the present channel. The same mischief would occur on the rising of the lake *during* the easterly gale,—the water would prefer filling the bay from the east *with* the wind, than from the west against it; also to the prejudice of the western channel. In both these operations, and in all operations that multiply the outlets from the bay of York, the present channel has every thing to loose and nothing to gain.

And what should we not risk in the event? A harbour, upon the banks of which the town is already built, and one possessing every nautical requisite—such as, a basin of perfect safety within, an excellent roadsted without, and easy access to both! And for what?—For a doubtful entrance upon a bleak and exposed coast; to track through a sluggish canal, embedded in a sickly marsh, to get a second entrance to a good land-locked harbour, at the value of ten minutes or a quarter of an hour in time to any steamer.

I have not neglected to examine the opening into the lake from Asbridge's Bay, which I think an important one, and confirms me in the opinion I have before expressed, that as the land to the east wore away, and left the peninsula exposed, in the event of time it would assume the form of a Presqú isle. I think the opening when I examined it in the winter was nearly one hundred yards wide; and from no ice being formed there, nor at some distance within, at a time when it was elsewhere thick, I should say the channel was seven or eight feet deep, but I had no opportunity of sounding. It is apparently protected by the projecting land to the N. E.; but this is only apparent, for the easterly sea has actually made the breach.—That the lake is here encroaching upon the island, is beyond a doubt. It has made its way so far as to undermine and throw down a long line of trees of many years growth, which have

all fallen their heads into the lake. Here, if any prospect should warrant the expense, an experiment might be made, by piling the sides of the entrance to stop the further progress of the breach. If that should succeed, there is so large a surface of water yet within the eastern bay, that a flux and reflux caused by the varying levels of the lake, might produce a good navigable channel; and the use of a dredging machine to cleanse the marsh, increase the surface, and deepen the water, would thus make a good harbour for local or private purpose; but I trust the experiment, without well weighing the consequence, will not be tried to make two outlets to the harbour of York.

To sum up my opinions, the channel should be contracted, the destroying cancer of the port (the Don) eradicated; and the dredging machine freely used. This done, the channel will deepen of itself, the existence of the port be indefinitely prolonged, the waters of the bay be more limpid, and the bay itself, washed by every wind, encircled by a clear and healthful beach, so to remain as long as human industry and intelligence lined its shores.

Otherwise, in a very few years, the east end of the town will be totally faced by a marsh; vessels that can enter the channel, will not find sufficient water at the wharves, and the wharves bridged out to any practicable distance will not find sufficient water for the vessels.

And now, in calling the attention of the country to the perishable condition of York harbour, I put it to the country,—whether the preservation of one of the four great portals to the commerce of Upper Canada on Lake Ontario, can be looked upon in any other light than public duty? Its local interest is so merged in the public good, that it cannot suffer without inflicting a public injury. Thousands may preserve, but millions will not construct such another port!

If after maturely weighing my opinions, they are found to be correct; if I have shewn the ruin of the port, to be not far distant in the vista of futurity; the Province cannot look with apathy on the scene,—the inhabitants of York will scarcely line the banks of its beautiful bason, reap the golden fruits of its commerce—be sensible of its decay, and insensible to the claims of posterity; there is nothing British in the thought!

R. STANTON, PRINTER.